

3 June 1960

MEMORANDUM FOR:

SUBJECT :

Spatial Coherent Light Viewer  
21 May 1960

Coherent Light Source

23 May 1960

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1. Spatial Coherent Light Viewer

This is a general proposal to study the practical use of coherent light sources in image viewing.

It suggests that something can be done with light systems other than a single pinhole source as in the  Spatial Viewer. It also suggests that some loss of light coherency can be tolerated without significant loss of edge enhancement. An interesting theory is advanced concerning this point, namely that by mixing diffracted light with coherent, it may be possible to enhance the contrast of low line numbers without affecting the enhanced edge gain of high line numbers. This is where I feel the Itek machine is failing at the moment (apart from the lack of light intensity).

The scope of the work would entail investigation of slit sources, multiple pinhole sources, disk and stop sources and aperture with ring disk stop sources. The last two are close to dark field and phase contrast lighting which we have investigated. The slit source is similar to  idea of vari-shaped phase contrast plates to enhance edges parallel to the slit. A further suggestion is also advanced regarding the use of diffraction oil as a means of reducing surface irregularities. This we have also done and found to be true.

However it would seem that our main interest would be in results of investigations into slit sources ~~the~~ multiple pinhole sources. I suggest that we leave this proposal until such time as Itek have re-worked the spatial viewer, and then consider it if the spatial viewer is still lacking in essential performance.

2. Coherent Light Source

This is a proposal to study the possibility of producing

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an extremely intense coherent light source. No price is stated. In general it discusses the value of a temporary coherent ~~radiation~~ <sup>TEMPORAL</sup> radiation source as in a radar system. Two approaches are theorised both using a Maser like mechanism. One is to obtain repeated light reflections with a subsequent gain for each passage, the other by using coherent sources of micro-waves.

It is suggested that this be primarily a paper study to investigate the two approaches prior to experimental work.

Again I suggest we hold back on this until ☐ have completed their work on our spatial viewer.

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